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DICKINSON WRIGHT PLLC
1825 Eye St., NW
Suite 900
WASHINGTON, DC 20006

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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*Ex parte* EDWARD L. DIEFENTHAL, RICHARD D. JORDAN, and RICHARD H. SCHLOSBERG

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Appeal 2018-000804
Application 13/420,373
Technology Center 1700

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Before DONNA M. PRAISS, N. WHITNEY WILSON, and JEFFREY R. SNAY, *Administrative Patent Judges*.

WILSON, *Administrative Patent Judge.*

## DECISION ON APPEAL

Appellant[1] appeals under 35 U.S.C. § 134(a) from the Examiner's October 21, 2016 decision finally rejecting claims 1, 5, 8–12, and 35–38 ("Final Act."). Claims 2– 4, 6, 7, and 13–34 have been cancelled. We have jurisdiction over the appeal under 35 U.S.C. § 6(b). An oral hearing was held on July 11, 2019, a transcript of which will be made part of the record.[2]

We reverse.

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[1] We use the word "Appellant" to refer to "applicant" as defined in 37 C.F.R. § 1.42. Appellant identifies Epic Oil Extractors, LLC, as the real party in interest (Appeal Br. 3).

[2] Appeal No. 2018-000800 is related to this appeal (Appeal Br. 3). The two appeals were argued together at the July 11, 2019 oral hearing.

## CLAIMED SUBJECT MATTER

Appellant's disclosure relates to an extraction process for producing a high quality crude oil product from oil sand (Spec. ¶ 21). The process includes supplying oil sand containing bitumen to a contact zone of an extraction vessel, where the oil sand supplied to the contact zone has an average particle size of not greater than 20,000 microns (Spec. ¶¶ 26, 28, and 54). The oil sand particles are moved through the contact zone of the extraction vessel, while a light solvent blend is injected into the extraction vessel (Spec. ¶¶ 26, 33, 34, 55, and 56). The light solvent blend has certain specific properties (Spec. ¶¶ 34, 44–46, 48, and 49). The claims also specify details about the steps for contacting the light solvent blend and the oil sand particles. Claim 1 is representative of the invention and is reproduced below from the Claims Appendix to the Appeal Brief (*emphasis added*):

> 1. A partial extraction process for producing a high quality crude oil composition from oil sand, comprising:
>
> a) supplying oil sand containing bitumen to a contact zone of an extraction vessel, wherein the oil sand supplied to the contact zone has an average particle size of not greater than 20,000 microns and the bitumen is comprised of a flowable oil component, volatile hydrocarbons and asphaltenes;
>
> b) moving the particles of oil sand through the contact zone of the extraction vessel;
>
> c) injecting a solvent blend into the extraction vessel, wherein the solvent blend has the following properties:
>
> (i) is a hydrocarbon mixture comprised of at least two hydrocarbons selected from the group consisting of propane, butane and pentane,
>
> (ii) has a Hansen dispersion blend parameter of not greater than 15,

(iii) has a Hansen polarity blend parameter of not greater than 1,

(iv) has a Hansen hydrogen bonding blend parameter of not greater than 1,

(v) has an ASTM D86 10% distillation point within the range of from -45°C to 50°C, and

(vi) has an ASTM D86 90% distillation point of not greater than 300°C;

d) treating the oil sand particles moving through the contact zone of the extraction vessel in step b) with the solvent blend in the contact zone of the extraction vessel as a vapor phase treatment, wherein

(i) not greater than 80 wt% of the bitumen is extracted from the supplied oil sand to produce an extracted crude oil composition and treated oil sand, with the treated oil sand containing unextracted bitumen comprised of asphaltenes,

(ii) the contact zone is at a temperature and pressure in which at least 20 wt% of the solvent injected into the extraction vessel is in vapor phase during treatment of the particles of oil sand with the solvent in the contact zone of the extraction vessel, with the contact zone temperature being at least 35°C, and

(iii) *no water is used in extracting the crude oil composition*;

e) removing the extracted crude oil composition from the extraction vessel, wherein the extracted crude oil composition comprises the high quality crude oil product and at least a portion of the solvent injected into the extraction vessel; and

f) separating at least a portion of the solvent from the extracted crude oil composition removed from the extraction vessel in step e) to recover the high quality crude oil product and a recycle solvent, wherein

(i) the high quality crude oil product is defined as having a nickel plus vanadium content of not greater than 100 wppm, an asphaltene content of not greater than 5 wt% and an

API gravity of at least 12, and

(ii) the recycle solvent has each of the Hansen solubility characteristics and each of the distillation point ranges within 20% of the solvent properties defined in step c).

## REJECTIONS

1. Claims 1, 5, and 8–12 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Hsieh[3] in view of Veatch[4] and Bowman.[5]

2. Claims 35–38 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Hsieh in view of Veatch and Bowman, and further in view of Phillips.[6]

## DISCUSSION

The Examiner's findings based on Hsieh are set forth in the Final Action (Final Act. 3–4). The Examiner finds that Hsieh teaches supplying oil sand having an average particle size of not greater than 20,000 microns containing bitumen to a contacting zone of an extraction vessel; moving the oil sand particles through the contact zone of the extraction vessel and injecting a solvent comprised of pentane, hexane, other solvents, or mixtures thereof into the extraction vessel and contacting the solvent with the oil sand particles moving through the contact zone of the extraction vessel; and extracting bitumen from the oil sand as extracted crude oil composition (*id*.).

[3] Hsieh et al., US 4,676,889, issued June 30, 1987.
[4] Veatch et al., US 4,174,263, issued November 13, 1979.
[5] Bowman, US 3,475,279 A1, issued October 28, 1969.
[6] Phillips et al., US 7,384,557 B2, issued June 10, 2008.

The Examiner also finds that Hsieh teaches removing the extracted crude oil composition from the vessel wherein the extracted crude oil contains at least a portion of the solvent, and then separating at least a portion of the solvent from the extracted crude oil composition to obtain high quality crude oil product and recycle solvent (*id*. at 4).

The Examiner further finds that Hsieh teaches that steam (i.e. water) can be used to raise the temperature of the solvent tar sand mixture (Final Act. 4). The Examiner finds that Veatch teaches "a similar process" for solvent extraction of tar sands using a non-steam heating method to obtain the desired solvent vaporization, and that Bowman discloses that moving belt zones provide heating via radiant energy sources (Final Act. 4–5). Therefore, according to the Examiner, it would have been obvious to a person of skill in the art "to have substituted the Veatch/Bowman moving belt radiant energy heating zone for the water addition of Hsieh, for the benefit of providing an alternate method to vaporize the solvent, since Veatch discloses such is equivalent" (*id*. at 5.)

Appellant argues, inter alia, that the claimed invention differs from Hsieh and the asserted combination of Hsieh with Veatch and Bowman in that "no water is used in extracting the crude oil composition." In particular, Appellant argues that even if a person of skill in the art had substituted the radiant heating of Veatch/Bowman for the steam/water heating of Hsieh, process would still require the use of water to extract the crude oil composition (Appeal Br. 18–20). Appellant relies on the Schlosberg Declaration as evidence that Hsieh's process requires the presence of water to be able to function (Appeal Br. 20; *see also* Schlosberg Decl. ¶¶ 11–13).

The Examiner does not dispute that the Hsieh process requires water to extract the crude oil composition. Instead, the Examiner finds that Appellant's Specification uses similar tar sands to those used by Hsieh, which contain water (Ans. 8). The Examiner's finding presumes that, to the extent that "no water is used in extracting the crude oil composition" in Appellant's process, Hsieh's process can operate the same way.

The Examiner's determination is reversibly erroneous. There is no dispute that Hsieh's process requires water to extract the crude oil composition. Hsieh states that if the amount of water naturally present in the oil sands is high enough, it may not be necessary to add water (Hsieh 2:22–31). A person of skill in the art would understand that Hsieh's process requires water to extract the crude oil composition and, therefore, would have had no reason to create a process in which "no water is used in extracting the crude oil composition," much less an expectation that such a process would be successful.

Accordingly, we reverse the rejection of claim 1 and the remaining claims on appeal, each of which depends from claim 1.

## CONCLUSION

In summary:

| Claims Rejected | Basis | Affirmed | Reversed |
|---|---|---|---|
| 1, 5, and 8–12 | § 103(a) Hsieh, Veatch, and Bowman | | 1, 5, and 8–12 |
| 35–38 | § 103(a) Hsieh, Veatch, Bowman, and Phillips | | 35–38 |
| **Overall Outcome** | | | 1, 5, 8–12, and 35–38 |

REVERSED